

**USN examines F-18 UCAV demonstration**

THE US NAVY is considering using the McDonnell Douglas (MDC) F-18 as the basis for a next-generation uninhabited combat air-vehicle (UCAV).

The USN is discussing launching a proof-of-concept demonstrator programme with Boeing and MDC which could lead to a first-generation operational UCAV based around the F-18 airframe.

Mike Foley, Boeing Defense & Aerospace Group's business development manager, force projection, says that the company is working with the USN to examine a demonstrator programme potentially leading to a deployable system.

Foley, speaking at a Royal Air Force UAV symposium at RAF Cranwell, says that the project would build upon the VECTOR study work involving the Rockwell/Daimler-Benz Aerospace X-31 looking at an airframe without the vertical stabiliser. Yaw control would be achieved by using integrated thrust-vector control.

The USA, with Germany and Sweden, is planning to restart flight testing the X-31.

Boeing is proposing building on the VECTOR technology, integrating this with the necessary onboard systems to develop a prototype UCAV.

Initially a conventional F-18 would be used - possibly with a pilot on board acting as a monitor - before a full UCAV configuration.

For the operational aircraft, Boeing is proposing removing the aircraft's twin vertical stabilisers, as well as the cockpit structure. □

**Cathay prepares to modify gearboxes on Trent 700s**

PAUL LEWIS/SINGAPORE  
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CATHAY PACIFIC and Dragonair are hoping that fitting modified engine-gearboxes to their Rolls-Royce Trent 700-powered Airbus Industrie A330-300s will clear the way for the grounded aircraft to return to service by early this week.

Both carriers voluntarily grounded their 15 A330s on 24 May, following an inflight engine shutdown the previous day.

The two have suffered five inflight engine shutdowns since November 1996 - four the result of bearing failures. After the fourth incident on 9 May, involving a Cathay A330 en route from Bangkok to Hong Kong, the airline suspended extended-range



Work is beginning on Cathay's A330s

twin-engined operations of more than 60min (*Flight International*, 21-27 May). Garuda, the other Trent 700-powered A330 operator, continues to fly its aircraft.

Operations have been disrupted, with Cathay Pacific alone having to

cancel nearly 100 flights in the first six days. Its 11 A330s account for 17% of the fleet and some 15% of seat capacity.

Dragonair has had similar problems because of its reliance on the A330 on main trunk routes to Beijing, Kaohsiung and Shanghai.

The grounding comes in the run-up to the busiest time in the airline's history as the UK prepares to hand back Hong Kong to China at the end of the month.

The carriers have tried to make up the shortfall, initially by transferring passengers to other airlines and, more recently, by chartering replacement aircraft.

Neither Cathay nor R-R will comment on the issue of compensation, saying that their prime concerns have been to focus on a solution to the problem. □

**Bearing failures blamed on poor lubrication**

THE SPATE of Trent 700 engine shutdowns has been traced to insufficient lubrication of the driving-shaft locator ball-bearing in the Hispano Suiza-manufactured step-aside gearbox. This has resulted in premature fatigue and failure of the bearing, because of overheating.

According to R-R, the problem resulted from a weakness in the design of the original lubrication system, which features a 20mm gap between where the oil is injected and the bearing itself.

The UK company says that it has been studying the problem since "early this year" and has tested a modification which it is "confident" will provide the solution. This involves installation of an oil-feed system with redesigned geometry, using a design already employed on the gearbox of the larger Trent 800, and installing a new bearing. The new system increases

the flow of oil lubrication to the bearing, eliminating any chance of oil starvation, and reduces operating temperatures from 170°C to 120°C.

"It effectively closes the gap, preventing the jet of oil from having to 'leap across' the void to lubricate the bearing," says R-R, adding that the modification is not expected to affect engine performance.

France's DGAC and the UK's Civil Aviation Authority are working to certify the modification as it is produced. R-R was planning to ship the first modification packages to Hong Kong over the weekend of 31 May/1 June.

Cathay says that it is tentatively scheduled to have the first A330 fitted with the system and test-flown by 2 June. The work can be undertaken on the wing, with just the gearbox being removed.

While the original grounding was voluntary, R-R says the

airlines need approval from Hong Kong's Civil Aviation Bureau (CAB) before the aircraft are returned to service. Cathay estimates it will take until the second week of June to return all 11 A330s and four Dragonair aircraft to service. Most are at foreign airports.

The A330/Trent 700 won European Joint Aviation Authorities clearance for 180min extended-range twin-engine operations (ETOPS) flights in mid-1996. The Hong Kong CAB had approved 138min ETOPS. In early May, Cathay voluntarily suspended ETOPS flights and, later, the CAB withdrew approval. Garuda has also suspended ETOPS flights. R-R says that, when the aircraft return to service, they will not operate ETOPS flights.

Although JAA approval has not been withdrawn, R-R is unclear whether the engine/airframe combination will have to requalify. □

**NEWS IN BRIEF**

■ **RAFALE ORDER**

The French Government has ordered the first 13 Dassault Rafale multi-role fighters following agreement with major subcontractors and Dassault to cut prices by 10%. A further order, for 48 aircraft, has been thrown into doubt by a possible change of government. The order covers ten Rafales for the navy and three for the air force.